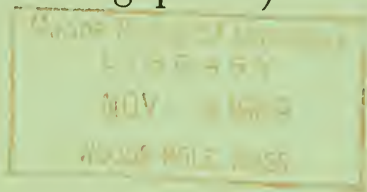


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A New Genus of Silicoflagellata from an
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ABSTRACT: A study of diatoms of Eocene age from south Atlantic deep-sea cores by Messrs. G D. Hanna, I. N. Hendey, and A. L. Brigger, resulted in the discovery of many silicoflagellates among which was *Hannaites quadria*, new genus and new species. The holotype, and all paratypes used in this study are deposited in the California Academy of Sciences Department of Geology Type Collection.

INTRODUCTION

Mounted specimens of silicoflagellates belonging to this new genus were given to me for description by Dr. G Dallas Hanna. They were found by Dr. Hanna and Dr. A. L. Brigger in a core collected by the Lamont Geological Observatory, Columbia University. The specimens were found during a California Academy of Sciences study of the diatom flora of this core.

The locality data are as follows: R/V *Vema* Cruise 17; core number, 107; water depth, 1525 meters; distance from top of core, 245 cm.; date of coring, 13 May 1961; latitude, 51°08'S.; longitude, 54°22'W.; age, Eocene; California Academy of Sciences locality number 39573 (9). A second Eocene sample, identical in all locality data details except distance from the top of the core, also contains this new genus. Its distance from the top of the core is 120 cm.

* Present address: 8 Bucareli Drive, San Francisco, California 94132

The photographs were made by Dr. Hanna. Because they were taken at high magnification, there is a depth of field problem. The raised apical bridge is not in the same plane as the basal ring. Hence the basal ring is in focus and the apical ring is out of focus.

Because silicoflagellates are not commonly seen, even by most micropaleontologists, a short statement about these rare microorganisms is included here.

Silicoflagellates are marine planktonic protistids with a flagellum and a skeleton of hollow siliceous rods. In the past they have been considered to be animals, plants, and microorganisms that have characters of both. In this paper they are classified under the rules of the International Commission of Zoological Nomenclature. A few species are living today and some have been found in rocks as old as late Cretaceous. (There are reports of older silicoflagellates, but they have not been adequately confirmed.) Studies by Mandra and Hanna indicate that these microfossils can be useful in stratigraphy and paleoecology.

All major papers on silicoflagellates were examined in order to make sure that the specimens described here are new.

ACKNOWLEDGMENT

I wish to thank Dr. G Dallas Hanna for the privilege of studying and reporting this new genus, for the use of the Academy's mounted specimens, for the excellent photographs, and for helpful comments and discussions. This study was supported by the Antarctic Programs of the National Science Foundation. *Vema* Cruise 17 was organized by Dr. M. Ewing, Director of Lamont Geological Observatory, and funded by the Office of Naval Research.

SYSTEMATICS

Order SILICOFLAGELLATA Borgert

Family DICTYOCHIDAE Deflandre¹

DESCRIPTION. Skeleton normally a basal ring and an apical bridge.

RANGE. Late Cretaceous to Recent. Cosmopolitan.

Genus *Hannaites* Mandra, new genus

TYPE SPECIES. *Hannaites quadria* Mandra, new species.

ETYMOLOGY. Generic dedication is made to honor Dr. G Dallas Hanna of the California Academy of Sciences.

DESCRIPTION. Basal ring consists of four side tubes nearly equal in length; each side tube may be straight, gently arcuate, or form an obtuse angle; the tubes are covered with small evenly spaced bosses (knobs or nodes); the diameter of these tubes is relatively small when compared to the length of each side tube (ratio varies from 1:15 to 1:25); and the basal ring may or may not have a few supporting spines.

¹ Dictyochaceae Lemmermann, 1901, p. 255

At each of the four corners of the basal ring there is a large, well rounded, spherical-like protuberance, the diameter of which is approximately three to four times the diameter of the basal ring tubes. On each of the four protuberances there are small, evenly spaced bosses (smaller protuberances). In the center of each of the four, large, corner structures there appears to be an inner sphere which seems to connect to the canals inside the basal ring tubes.

The apical bridge is a simple elevated tube connected at each end to two supporting tubes. Each of the latter four tubes are in turn attached to the central region of each of the four basal ring tubes. The height of the top of the apical bridge above the plane of basal ring is one-fifth to one-eighth the length of a basal ring tube.

AGE, DISTRIBUTION, AND TYPE LOCALITY. Eocene. The genus has been found only in the South Atlantic deep-sea core described earlier in this paper. The Eocene age is based upon that of the associated diatom flora and confirmed by the remaining silicoflagellate fauna, both of which clearly indicate Eocene age.

REMARKS. This new genus bears a resemblance to *Dictyocha* in its apical bridge structure. It differs from *Dictyocha* in the possession of large, prominent, spherical-like protuberances at each of the four corners of the basal ring.

Corbisema geometrica Hanna, *Dictyocha triacantha inermis* Lemmermann, *D. archangelskiana* (Schulz), *D. bimucronata* (Deflandre), and *Phyllodictyocha schulzi* Deflandre, like the new species, have no radiating basal spines. They differ by having a three-rayed apical bridge. The new genus has a five-rayed apical bridge. Also, the other genera do not have the prominent, corner, spherical-like protuberances.

Dictyocha quadralta Hanna, 1928, is remarkably similar to the one species of this new genus. The two species differ in that *Hannaites quadria*, new species, has pronounced spherical-like protuberances, whereas *Dictyocha quadralta* has only short spines. Deflandre (1950) transferred *Dictyocha quadralta* to the genus *Corbisema*.

Hannaites quadria Mandra, new species.

(Figures 1, 2, 3, 4, 5, 6, 7.)

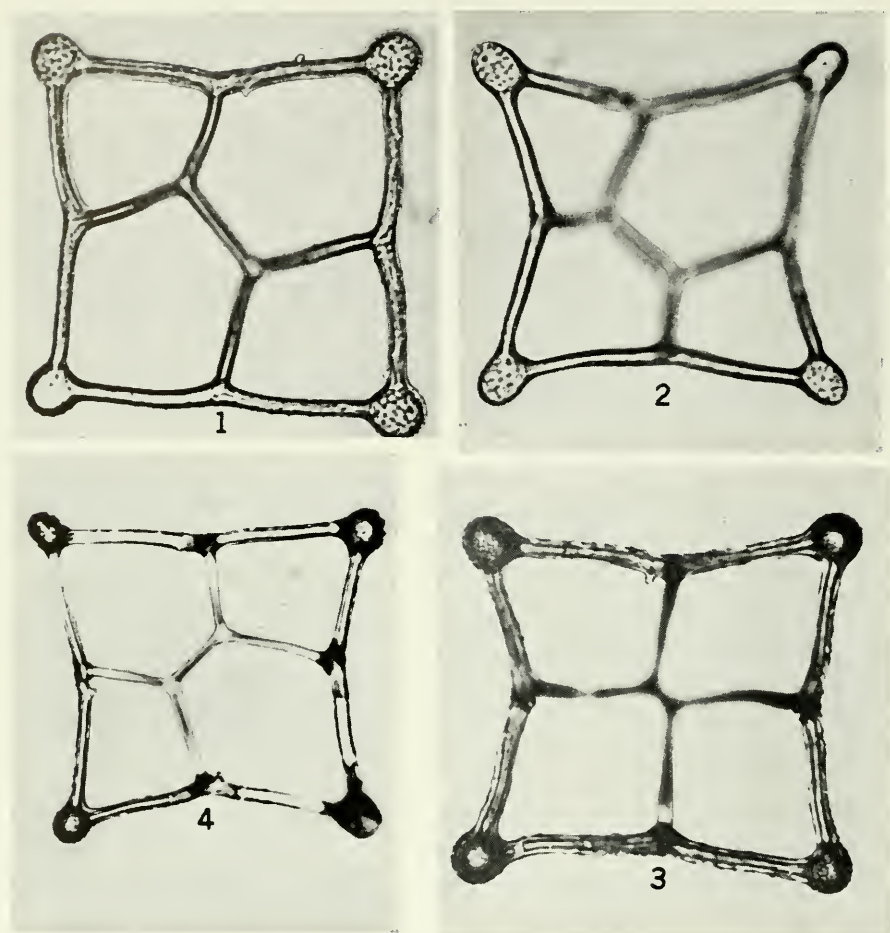
DESCRIPTION. Same as for the genus.

HOLOTYPE, no. 3954, California Academy of Sciences, Department of Geology, Type Collection. Locality no. 39573 (9) (CAS). (See Introduction.)

PARATYPES, nos. 3955, 3956, 3957, 3958, California Academy of Sciences, Department of Geology, Type Collection. Locality 35573 (9) (CAS).

AGE, DISTRIBUTION, AND TYPE LOCALITY. Same as for the genus.

REMARKS. The holotype was selected from four specimens on one slide because its outline of four gently-concave sides seems more typical of the species



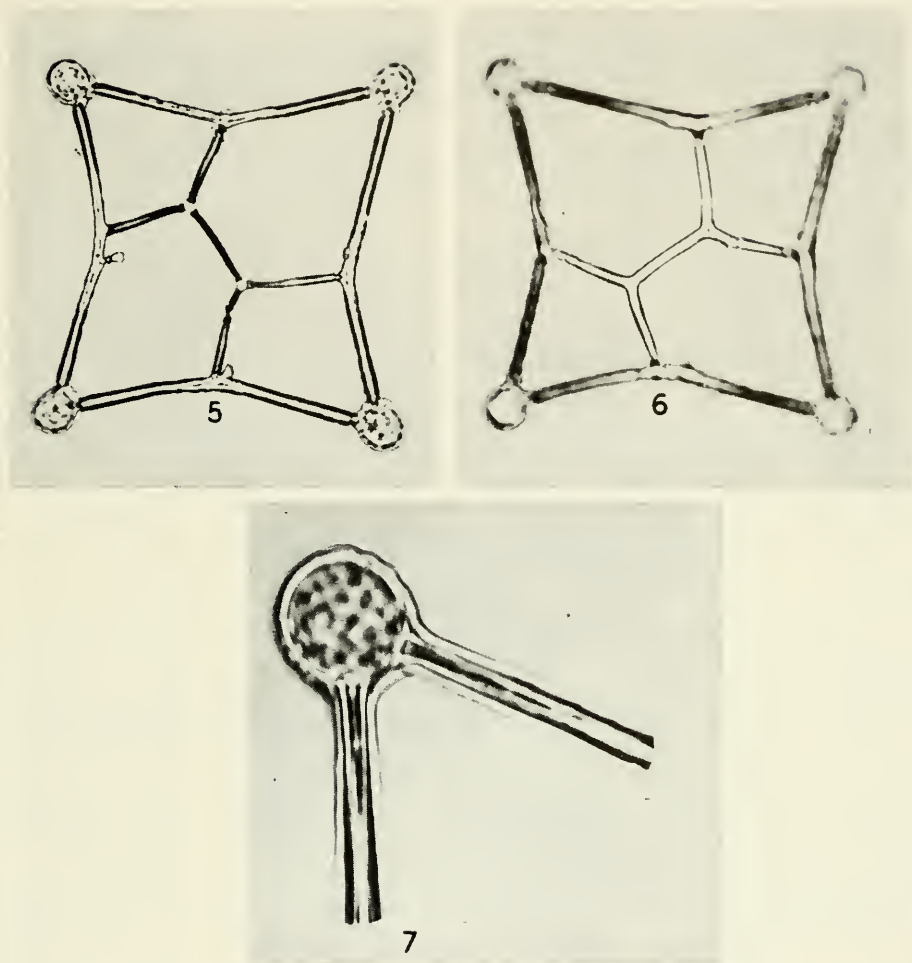
FIGURES 1-4. *Hannaites quadria* Mandra, new species. FIGURE 1. Paratype no. 3955 (CAS). Maximum dimension, 87 microns; central apical tube length, 15 microns.

FIGURE 2. Holotype no. 3954 (CAS). Maximum dimension, 82 microns; central apical tube length, 14 microns.

FIGURE 3. Paratype no. 3956 (CAS). Maximum dimension, 80 microns; central apical tube length, 4 microns.

FIGURE 4. Paratype no. 3957 (CAS). Maximum dimension, 83 microns; central apical tube length, 15 microns.

than the straight-sided form. Two paratypes have an outline similar to the holotype, but in one case the apical bridge is atypically short, and in the other case one supporting bar of the apical bridge is broken.



FIGURES 5-7. *Hannaites quadria* Mandra, new species. FIGURE 5. Basal ring in focus. Paratype no. 3958 (CAS). Maximum dimension 74 microns; central apical tube length, 12 microns.

FIGURE 6. Apical ring in focus. Paratype no. 3958 (CAS). Maximum dimension, 74 microns; central apical tube length, 12 microns.

FIGURE 7. External details of small boss of a corner protuberance of Paratype no. 3958 (CAS). Maximum external diameter of spherical-like structure, 6 microns.

Paratype (no. 3956, fig. 3) displays the inner canals more clearly than the holotype. Paratypes (nos. 3956, 3958, figs. 3, 6) have basal ring structures which appear to be undeveloped spines.

Measurements in microns of types are as follows:

Specimen	Long axis	Short axis	Central apical tube length	Basal ring tube diameter	Diameter of corner pro- tuberances
Paratype no. 3958 (Figures 5, 6, 7)	74	71	12	2	6
Holotype no. 3954 (Figure 2)	82	79	14	2	7
Paratype no. 3956 (Figure 3)	80	81	4	3	8
Paratype no. 3957 (Figure 4)	83	82	15	2	9
Paratype no. 3955 (Figure 1)	87	82	15	2	9
Mean of five types	81	79	12	2	8
Median of five types	82	81	14	2	8

Subsequent to this description, Dr. Hanna found another specimen of this new genus. Its dimensions are consistent with the above.

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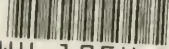
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